1. STUDY INFORMATION

Chemical:	Sulfoxaflor	**PC Code:**	005210
Test Material:	Closer® SC	**Purity:**	21.8% (w:w) ai (241 g/L)
Study Type:	Non-guideline field residue study on strawberry to establish sulfoxaflor and various metabolite levels in whole flowers, pollen and nectar following two foliar applications.		
Sponsor:	Dow AgroSciences LLC	**Performing Laboratories:**	
	9330 Zionsville Road	**(Trial 01):** Florida Ag Research, 3001 N. Kingsway Road, Thonotosassa, Florida 33592	
	Indianapolis, Indiana 46268		
Report Number:	14050.4116	**(Trial 02):** Turner Ag Research, 1233 E. Beamer Street, Suite E, Woodland, California 95776	
Study Completion Date:	November 17, 2017	**(Analytical):** Smithers Viscient, MRC, 790 Main Street, Wareham, Massachusetts 02571	
Experiment Start/End Date:	July 8, 2016 to September 30, 2016 (field phase)		
Study Location:	2 Field Trials: Dover, Florida (14050-4116-01); Yuba City, California (14050.4116-02)		
GLP Status:	GLP-compliant; ENV/MC/CHEM(98)17 (OECD)		

2. REVIEWER INFORMATION

Primary Reviewer:	Christie E. Padova, B.S., Environmental Scientist, CDM/CSS-Dynamac JV
Signature:	*Christie E. Padova*
Date:	03/29/17
Secondary Reviewer:	Keith Sappington, Senior Science Advisor, OPP/EFED/ERB5
Signature:	
Date:	7-10-19

This Data Evaluation Record may have been altered by the Environmental Fate and Effects Division subsequent to signing by CDM/CSS-Dynamac JV personnel. The CDM/CSS-Dynamac Joint Venture role does not include establishing Agency policies.

3. EXECUTIVE SUMMARY

This study was designed to measure the magnitude of residues of sulfoxaflor and its four major metabolites, X11579457, X11719474, X11519540 and X11721061, in strawberry (*Fragaria l.*) whole plant, nectar and pollen, which represent potential exposure risks to pollinators in the field. Two separate trials were conducted, at locations in Florida (Trial 1) and California (Trial 2). Three subplots at each trial location received two foliar applications of Closer® SC at 0.070 lb ai/A/application, based on a maximum seasonal rate of 0.140 lb ai/A, applied in two application timings at the minimum retreatment interval of 7 days. Whole plants were collected from each site prior to treatment, and whole plant and flower samples (for nectar and pollen) were collected from early- through late-bloom for residue analysis (0 through 14 DALA). Samples were collected and analyzed by validated analytical methods to determine the residue concentrations.

A summary of the key findings is as follows:

1. Two foliar applications to strawberry plants at 0.070 lb ai/A/application (based on a maximum seasonal rate of 0.140 lb ai/A), yielded detectable residues of sulfoxaflor in nectar, pollen and whole plants at both trial sites.
2. In strawberry plant matrices, total sulfoxaflor residues (TSR) were greatest for each trial site in pollen, followed by nectar and then whole plant matrices, and measured residues were greater in the California trial (Trial 2) compared to Florida (Trial 1). In California, maximum mean TSR levels were 104, 18.5, and 5.32 mg/kg in pollen, nectar, and whole plant matrices, respectively, and in Florida, maximum mean TSR levels were 23.8, 3.45, and 6.01 mg/kg, respectively.
3. In pollen samples, parent sulfoxaflor accounted for the majority of TSR at both trial sites, while in nectar and whole plant samples, sulfoxaflor accounted for the majority of TSR at the California trial, and metabolite X11719474 accounted for the majority of TSR at the Florida trial. Maximum mean concentrations of sulfoxaflor observed at the California trial (0 DALA) were 65.3 mg/kg in pollen, 15.2 mg/kg in nectar, and 3.32 mg/kg in whole plant. Maximum mean concentrations of sulfoxaflor at the Florida trial (0 DALA) were 18.8, 1.41, and 2.90 mg/kg in pollen, nectar, and whole plant samples, respectively. The major metabolite, X11719474, was present at maximum mean concentrations of 4.72 and 37.2 mg/kg in pollen from Florida and California trials (each at 0 DALA), respectively, and ranged from maximum means of 1.93 to 4.67 mg/kg in nectar and whole plant samples from both trials (0 to 7 DALA). Metabolite X11519540 was present at maximum mean concentrations of 0.190 and 1.04 mg/kg in pollen from Florida and California trials (each at 0 DALA), respectively. Metabolites X11579457 and X11721061 were found at maximum mean concentrations of 0.183 mg/kg and 0.191 mg/kg, respectively, in pollen from the California trial (each at 0 DALA).

Analyte	Matrix	Maximum Measured Concentration (mg/kg)	Study Site	Maximum Average Concentration (mg/kg)	Study Site
Sulfoxaflor	Pollen	81.9	California	65.3	California
	Nectar	16.8	California	15.2	California
	Whole Plant	3.97	California	3.32	California
X11579457	Pollen	0.309	California	0.183	California
	Nectar	0.0153	California	0.0103	California

Analyte	Matrix	Maximum Measured Concentration (mg/kg)	Study Site	Maximum Average Concentration (mg/kg)	Study Site
	Whole Plant	0.0553	California	0.0218	California
X11719474	Pollen	71.8	California	37.2	California
	Nectar	5.36	California	3.19	California
	Whole Plant	4.97	Florida	4.67	Florida
X11519540	Pollen	1.44	California	1.04	California
	Nectar	0.164	California	0.138	California
	Whole Plant	0.0609	Florida	0.0534	Florida
X11721061	Pollen	0.318	California	0.191	California
	Nectar	0.0562	Florida	0.0352	Florida
	Whole Plant	0.159	Florida	0.148	Florida

4. Trends in sulfoxaflor and total sulfoxaflor residue (TSR) concentrations declined in strawberry pollen, nectar, and whole plant samples from the early- and early-mid bloom period (0-2 DALA) to the late-bloom period (14 DALA) at both trial locations.
5. The DT_{50} values for sulfoxaflor in nectar were 0.50 (CA site) and 2.6 days (FL site). The DT_{50} values for sulfoxaflor in pollen were 0.51 (CA site) and 0.88 days (FL site).

4. STUDY VALIDITY

Guideline Followed:	Non-guideline study
Guideline Deviations:	N/A
Other Deviations:	1. % recovery of sulfoxaflor in pollen QC spikes exceeds acceptance criteria for 3/6 samples at LOQ (e.g., **124% - 154%);** justification for excluding samples from mean % recovery was not provided or is questionable. While this is a deviation, over estimation of sample residue would be protective of a lower value and these deviations affect values near the LOQ. 2. Frozen storage stability was not assessed for peach nectar and pollen, but data was provided for other matrices. 3. Only two sites were evaluated, whereas USEPA (2016) recommends a minimum of 3 sites/regions within the growing area. Therefore, variability in residue values associated with geographic differences among growing regions may be underestimated.
Classification:	Supplemental
Rationale:	The aforementioned deviations related to % recovery deviations and number of sites evaluated.
Reparability:	N/A

5. MATERIALS AND METHODS

Test Material Characterization			
Test item: **Synonyms:**	Closer® SC (GF-2032) Isoclast™ (ai), XDE-208 (ai)	**CAS #:**	946578-00-3
Description:	Suspension concentrate	**Purity:**	21.8% (w:w) sulfoxaflor (ai)

Lot No./Batch No.	D523G2A003	Density:	1.1061 g/mL at 20°C
Material Source:	Not reported	Cert. #	Not reported
Material Receipt Date:	Not reported	Analysis Date:	April 7, 2016
Expiration Date:	November 8, 2018	Solubility:	Not Reported
Storage of Test Mat'l:	Not reported	Sample Storage:	Not reported

5A. STUDY DESIGN

This study was conducted to quantify the magnitude and decline of residues of sulfoxaflor and its major metabolites – X11579457, X11719474, X11519540 and X11721061 – in strawberry (*Fragaria l.*) matrices following two foliar application of Closer® SC at 0.070 lb ai/A/application to field plots planted to strawberry in Florida (Trial 1) and California (Trial 2). Applications were made during early bloom (BBCH 60-62), with a retreatment interval (RTI) of 7 days. Test plots were divided into three replicate areas (A, B, and C), each measuring a minimum of 80 feet x 100 feet. A control plot was not included in the study design; control of experimental bias was achieved through replication within the test item treatment groups. Whole plant samples were collected prior to the first treatment (-7 DALA for the Florida trial and -14 DALA for the California trial), and whole plants, nectar, and pollen samples were collected 0, 1, 2, 7 and 14 DALA. The four metabolites of interest were X11579457 (5-[1-(S-methylsulfonimidoyl)ethyl]-2-(trifluoromethyl)pyridine), X11719474 (N-(methyl(oxido){1-[6-(trifluoromethyl)pyridin-3-yl]ethyl}-λ^4-sulfanylidene)urea), X11519540 (5-[1-(methanesulfonyl)ethyl]-2-(trifluoromethyl)pyridine), and X11721061 (1-[6-(trifluoromethyl)pyridine-3-yl]ethanol). Soil samples were not collected. These data can be used to quantify the potential dietary exposure to pollinators in the field.

5B. APPLICATION TIMING AND RATES

Closer® SC, a soluble concentrate formulation containing 21.8% sulfoxaflor, was applied twice to foliage of commercial varieties/cultivars of strawberry at 0.070 lb ai/A/application (79 g ai/ha/application). Applications were made during early bloom (BBCH 60-62; 7-day RTI) via boom sprayers at spray volumes of 97.6-105 gal/A (97.6-105% of target) during Trial 1 and 28.5-29.5 gal/A (103-104% of target) during Trial 2. Information on the application rates and timing of applications is provided in **Table 1.**

Table 1. Summary of strawberry study site characteristics (treated sites only).

Attribute	Site 1 (14050-4116-01) Dover, Florida	Site 2 (14050-4116-02) Yuba City, California
Variety	Radiance	Albion
Transplant Date	October 5 through 13, 2016	March 9, 2016
Application Dates	App 1: January 24, 2017 App 2: January 31, 2017	App 1: July 19, 2016 App 2: July 26, 2016
Air Temp (°F)	App 1: 67 App 2: 41.2	App 1: 72 App 2: 66
Humidity (%)	App 1: 49.7 App 2: 89.8	App 1: 55 App 2: 68
Wind speed (mph)/direction	App 1: 2.1/NW App 2: 0/---	App 1: 2.3-3.8/W App 2: 0/---

Attribute	Site 1 (14050-4116-01) Dover, Florida	Site 2 (14050-4116-02) Yuba City, California
Timing	App 1: prior to/early bloom App 2: prior to/early bloom	App 1: prior to/early bloom App 2: prior to/early bloom
BBCH Growth Stage	App 1: 61 App 2: 60-62	App 1: 61 App 2: 61
Spray Volume (gal/A)	App 1: 105 App 2: 97.6	App 1: 29.5 App 2: 28.5
Rate (lb ai/A)	App 1: 0.0737 (105% of target) App 2: 0.0683 (97.6% of target)	App 1: 0.0720 (103% of target) App 2: 0.0727 (104% of target)
Soil Type	Sand	Clay loam
OM (%)	1.7	2.1
pH	4.9	6.3
CEC (meq/100g)	5.3	18.7
Sand/Silt/Clay (%)	98/2/0	28/36/36

5C. STUDY SITE LOCATION AND CHARACTERISTICS

A summary of application, soil, and meteorological data from the two study sites is shown in **Table 1.** Trials were conducted on planted plots of sand (Florida) or clay loam (California) soils. Soil organic matter varied from 1.7 to 2.1% for each trial. Standard agronomic practices for growing strawberry were used on the treated test plots. Other chemicals applied at the Florida trial plots during 2016/2017 were chlorantraniliprole-thiamethoxam, acetamiprid, malathion, abamectin, naled, and bifenthrin, while sethoxydim and clethodim were applied during 2016 at the California trial plots. Overall, the weather conditions did not negatively impact the crop growth or development. For the Florida trial, the average minimum and maximum air temperatures were 53.4 to 75.7°F during January 2017 (February 2017 data were not provided). No supplemental irrigation was reported during the Florida trial, which received 2.97 inches of rainfall during January 2017. For the California trial, the average minimum and maximum air temperatures were 56.4 to 91.5°F and 53.6 to 91.0°F during the months of July and August 2016, respectively. Drip-tape irrigation provided 11.5 inches of irrigation water (in 0.5- to 1.0-inch increments) to California trial plots during the months of July and August 2016, as no rainfall was recorded.

5D. SAMPLE COLLECTION, HANDLING, PROCESSING

Plant Matrices:

For each matrix, one sample was collected from each replicate plot A, B and C. Whole plant samples were collected 0, 1, 2, 7, and 14 DALA, encompassing early (x2), early-mid, mid, and late bloom periods (BBCH 61 to 68). A single untreated control sample of whole plants was also collected from each replicate plot prior to the first application (-7 DALA for the Florida trail and -14 DALA for the California trial). Strawberry plants were indiscriminately-selected, hand-clipped and trimmed of fruit and flowers, and double-bagged in sealable gallon-size plastic bags. The target weight for whole plants was 500 g. Samples were placed in a cooler on substitute ice, transported to the field station, and placed in frozen storage.

Whole flowers – for the purpose of extracting nectar and pollen – were collected at 0, 1, 2, 7, and 14 DALA. Flowers were indiscriminately-selected throughout the plots and all areas of the strawberry plants; care was taken not to cross-contaminate between replicate plots. Samples were sealed in plastic bags and

transported in coolers on substitute ice to the field laboratory for processing. At the field station, nectar was extracted from whole flowers using centrifugation and collected directly into capillary tubes. Additional whole flowers were dried (usually overnight), and the pollen was dislodged by hand-tapping onto black tiles and then transferred to sample vials. The target weight for nectar and pollen samples was 100 mg.

Samples (whole plants, nectar and pollen) were maintained frozen until shipped overnight via commercial freezer trucks to the analytical laboratory in Wareham, Massachusetts.

Soil. Soil samples were not collected for residue analysis.

Sample storage and transport: All sample matrices (whole plant, nectar, and pollen) were shipped frozen overnight from the field stations to the analytical laboratory, where they were received frozen or cold and in good condition. All samples were subsequently stored frozen (-25 to -10°C) at the analytical laboratory prior to extraction and analyses. Whole plant samples were macerated with dry ice to obtain a homogeneous sample prior to extraction. Whole plant, nectar, and pollen samples from the Florida trial were stored frozen for up to 77, 71, and 72 days (≤2.5 months) prior to analysis, respectively. Whole plant, nectar, and pollen samples from the California trial were stored frozen for up to 255, 210, and 210 days (≤8.4 months) prior to analyses, respectively. Tank mixes were also sampled at each application date and stored frozen for up to 136 days (4.5 months) for the Florida trial or 324 days (10.7 months) for the California trial prior to analysis.

5E. ANALYTICAL METHODS

The residues of sulfoxaflor and its major metabolites X11579457, X11719474, X11519540, and X11721061 were determined in whole plant, pollen and nectar samples using liquid chromatography/mass spectrometry (LC/MS/MS). Details of the analytical methods are provided in the study report. Residues were extracted from pollen, nectar, and whole plant samples with acetonitrile:purified water (80:20, v:v), and extracts were concentrated under nitrogen followed by enzymatic deconjugation, and cleaned-up with solid phase extraction (SPE). The method was validated by fortification of pollen, nectar, whole plant, and 50% sucrose solution matrices with sulfoxaflor, X11579457, X11719474, X11721061, and X11519540 at the LOD (*ca.* 1/3 of the LOQ), the LOQ, and high-level concentrations of 100X, 2000X, or 1000X the LOQ (Smithers Viscient Study Nos. 14050.6275 and 14050.6268). For metabolites X11579457 and X11519540, pollen matrix effects were observed to be >20%; therefore, matrix-matched standards were used for these analyses.

5F. QUALITY ASSURANCE

Freezer Stability. The frozen storage stability of sulfoxaflor and its metabolites X11719474 and X11721061 were demonstrated in various crop matrices (orange whole fruit, peach whole fruit, wheat grain, and soybean seed) for at least 680 days (22.4 months) when stored at *ca.* -20°C (MRID 47832224); storage stability of the remaining metabolites was not reported. Frozen storage stability was also demonstrated in sunflower pollen and nectar stored frozen at ≤-18°C for at least 9 months (Dow AgroSciences Study No. 150537). It was reported an additional storage stability study is on-going to determine stability of the metabolites in pollen and nectar.

Transit Stability: Transit stability samples were not included in the study design.

Spike Recoveries. The performance of the analytical method for determination of sulfoxaflor and metabolite residues in strawberry matrices was determined with each set of field samples by fortifying aliquots of appropriate control matrix (obtained prior to treatment) with a mixed solution of sulfoxaflor and its metabolites (QC samples). The limits of detection and quantification for each analyte during the analytical phase are provided in **Table 2**.

Control pollen samples were fortified with sulfoxaflor and metabolites (X11579457, X11719474, X11519540, and X11721061) at 0 mg/kg (control), 0.00300 mg/kg (LOD), 0.0100 mg/kg (LOQ), 10.0 mg/kg (1000X LOQ), or 100 mg/kg (10,000X LOQ). Control nectar samples were fortified with sulfoxaflor at 0 (control), 0.000300 mg/kg (LOD), 0.00100 mg/kg (LOQ), 1.00 mg/kg (1000X LOQ), or 5.00 mg/kg (50,000X LOQ), or with metabolites (X11579457, X11719474, X11519540, and X11721061) at 0 mg/kg (control), 0.00300 mg/kg (LOD), 0.0100 mg/kg (LOQ), 1.00 mg/kg (100X LOQ), or 5.00 mg/kg (500X LOQ). Control whole plant samples were fortified with sulfoxaflor and metabolites (X11579457, X11719474, X11519540, and X11721061) at 0 mg/kg (control), 0.00300 mg/kg (LOD), 0.0100 mg/kg (LOQ), 1.00 mg/kg (100X LOQ), or 5.00 mg/kg (500X LOQ). Samples fortified at the LOD demonstrated that observable peaks at the LOD could be distinguished from untreated control samples; results were not included for average percent recoveries.

Table 2. Method LOQ and LOD in each matrix.

Analyte	Matrix	LOQ (mg/kg)	LOD (mg/kg)
Sulfoxaflor	Whole plant	0.0100	0.00300
	Pollen	0.0100	0.00300
	Nectar	0.00100	0.000300
X11579457, X11719474, X11519540, X11721061	Whole plant	0.0100	0.00300
	Pollen	0.0100	0.00300
	Nectar	0.0100	0.00300

6. RESULTS:

6.A. QUALITY ASSURANCE RESULTS

Transit Stability. Transit stability samples were not included in the study design.

Spike Recoveries. The individual QC recoveries for all analytes generally fell within the range of 70 to 120%; recoveries outside this range were evaluated on a case-by-case basis and were included in statistical calculations if deemed not to be outliers. **Relative standard deviations (RSD) at each level were all less than 20%, with the following exceptions:** 26.5% for X11579457 in pollen, 21.7% for X11579457 in nectar, 22.3% for X11719474 in pollen, 28.4% for X11519540 in pollen, and 22.8% for X11519540 in nectar. Results from laboratory spiked QC samples are summarized in **Table 3**.

Table 3. Concurrent Recoveries.

Analyte	Matrix	Fortification Levels (ng/g)	Recovery Range (%)	Mean Recovery (% ± SD)	RSD (%)	n
Sulfoxaflor	Whole plant	0.0100/1.00/5.00	62.0 – 103	80.0 ± 13.3	16.6	12
	Pollen	0.0100/10.0/100	62.8 – 129	96.8 ± 17.9	18.5	14
	Nectar	0.00100/1.00/5.00	71.1 – 138	96.6 ± 18.2	18.9	14
X11579457	Whole plant	0.0100/1.00/5.00	71.4 – 120	88.3 ± 13.1	14.9	13
	Pollen	0.0100/10.0/100	64.1 – 155	92.0 ± 24.4	26.5	15
	Nectar	0.0100/1.00/5.00	48.3 – 100	79.6 ± 17.2	21.7	14
X11719474	Whole plant	0.0100/1.00/5.00	85.7 – 140	106.3 ± 16.2	15.2	16
	Pollen	0.0100/10.0/100	45.0 - 120	83.1 ± 18.5	22.3	14
	Nectar	0.0100/1.00/5.00	76.0 – 119	103.5 ± 11.4	11.0	14
X11519540	Whole plant	0.0100/1.00/5.00	67.7 – 101	83.2 ± 10.2	12.3	15
	Pollen	0.0100/10.0/100	60.0 – 145	81.9 ± 23.3	28.4	15
	Nectar	0.0100/1.00/5.00	45.5 – 102	73.4 ± 16.7	22.8	14
X11721061	Whole plant	0.0100/1.00/5.00	60.7 – 111	75.5 ± 13.5	17.9	15
	Pollen	0.0100/10.0/100	75.0 – 119	90.9 ± 12.5	13.7	15
	Nectar	0.0100/1.00/5.00	73.5 – 109	95.8 ± 10.9	11.4	14

6.B. Magnitude of Residues in Bee-Relevant Matrices

Strawberry Nectar, Pollen, and Whole Plant. Summary statistics of the overall magnitude of sulfoxaflor, X11579457, X11719474, X11519540, X11721061, and total sulfoxaflor residues (TSR) are shown in **Tables 4-7**. In pollen samples, parent sulfoxaflor accounted for the majority of TSR at both trial sites, while in nectar and whole plant samples, sulfoxaflor accounted for the majority of TSR at the California trial, and metabolite X11719474 accounted for the majority of TSR at the Florida trial. Concentrations of residues were higher in California relative to Florida, and were found at greatest concentrations in pollen, followed by nectar and then whole plant tissue. Maximum mean concentrations of sulfoxaflor observed at the California trial (0 DALA) were 65.3 mg/kg in pollen, 15.2 mg/kg in nectar, and 3.32 mg/kg in whole plant. Maximum mean concentrations of sulfoxaflor at the Florida trial (0 DALA) were 18.8, 1.41, and 2.90 mg/kg in pollen, nectar, and whole plant samples, respectively. The major metabolite, X11719474, was present at maximum mean concentrations of 4.72 and 37.2 mg/kg in pollen from Florida and California trials (each at 0 DALA), respectively, and ranged from maximum means of 1.93 to 4.67 mg/kg in nectar and whole plant samples from both trials (0 to 7 DALA). Metabolite X11519540 was present at maximum mean concentrations of 0.190 and 1.04 mg/kg in pollen from Florida and California trials (each at 0 DALA), respectively. Metabolites X11579457 and X11721061 were found at maximum mean concentrations of 0.183 mg/kg and 0.191 mg/kg, respectively, in pollen from the California trial (each at 0 DALA). When enough sample material was available, the sugar content of the nectar samples was measured; the resultant Brix % ranged from 5.2 to 9.7 °Bx.

Table 4. Maximum analyte residues recovered from strawberry pollen, nectar, and whole plant across all sampling dates.

Trial Site	Sulfoxaflor (mg/kg)	X11579457 (mg/kg)	X11719474 (mg/kg)	X11519540 (mg/kg)	X11721061 (mg/kg)	Total Sulfoxaflor Residues (TSR) (mg/kg)
Pollen from Flowers						
Dover, FL	41.5	0.0184	10.4	0.349	0.0735	43.0
Yuba City, CA	81.9	0.309	71.8	1.44	0.318	138
Nectar from Flowers						
Dover, FL	2.07	<LOQ	2.93	0.0194	0.0562	5.08
Yuba City, CA	16.8	0.0153	5.36	0.164	0.0272	22.4
Whole Plant						
Dover, FL	3.04	0.0166	4.97	0.0609	0.159	6.49
Yuba City, CA	3.97	0.0109	2.31	0.0469	0.0637	5.92

LOQ/LOD = 0.00100/0.000300 mg/kg for sulfoxaflor in nectar; LOQ/LOD = 0.0100/0.00300 mg/kg for all remaining analytes in all remaining matrices.

Table 5. Maximum mean analyte residues recovered from strawberry pollen, nectar, and whole plant across all sampling dates.

Trial Site	Sulfoxaflor (mg/kg)	X11579457 (mg/kg)	X11719474 (mg/kg)	X11519540 (mg/kg)	X11721061 (mg/kg)	Total Sulfoxaflor Residues (TSR) (mg/kg)
Pollen from Flowers						
Dover, FL	18.8	<LOQ	4.72	0.190	0.0528	23.8
Yuba City, CA	65.3	0.183	37.2	1.04	0.191	104
Nectar from Flowers						
Dover, FL	1.41	<LOQ	2.05	0.0158	0.0352	3.45
Yuba City, CA	15.2	0.0103	3.19	0.138	0.0249	18.5
Whole Plant						
Dover, FL	2.90	0.0135	4.67	0.0534	0.148	6.01
Yuba City, CA	3.32	<LOQ	1.93	0.0422	0.0483	5.32

LOQ/LOD = 0.00100/0.000300 mg/kg for sulfoxaflor in nectar; LOQ/LOD = 0.0100/0.00300 mg/kg for all remaining analytes in all remaining matrices.

Table 6. Mean (min, max) concentrations of analytes in strawberry pollen, nectar, and whole plant in Dover, Florida (Trial 14050-4116-01).

DALA	Sulfoxaflor (mg/kg)	X11579457 (mg/kg)	X11719474 (mg/kg)	X11519540 (mg/kg)	X11721061 (mg/kg)	Total Sulfoxaflor Residues (TSR) (mg/kg)
			Pollen from Flowers			
0	18.8 (5.68, 41.5)	<LOQ (<LOQ, 0.0184)	4.72 (1.07, 10.4)	0.190 (0.0616, 0.349)	0.0528 (0.0244, 0.0735)	23.8 (8.47, 43.0)
1	9.48 (4.93, 11.9)	<LOQ (<LOD, <LOQ)	0.828 (0.214, 1.75)	0.0660 (0.0380, 0.0849)	0.0444 (0.0361, 0.0504)	10.4 (5.22, 13.5)
2	2.94 (2.35, 3.75)	<LOD (<LOD, <LOD)	0.257 (0.0869, 0.475)	0.0230 (0.0142, 0.0305)	0.0247 (0.0172, 0.0313)	3.24 (2.47, 4.29)
7	0.626 (0.482, 0.785)	<LOD (<LOD, <LOD)	0.157 (0.0916, 0.239)	<LOQ (<LOQ, <LOQ)	0.0115 (0.0101, 0.0140)	0.801 (0.720, 0.945)
14	0.0632 (0.0441, 0.0852)	<LOD (<LOD, <LOD)	0.0221 (0.0181, 0.0265)	<LOD (<LOD, <LOD)	<LOD (<LOD, <LOD)	0.0898 (0.0751, 0.108)
			Nectar from Flowers			
0	1.41 (1.34, 1.51)	<LOQ (<LOD, <LOQ)	0.812 (0.315, 1.07)	0.0120 (<LOQ, 0.0173)	<LOQ (<LOQ, 0.0143)	2.24 (1.67, 2.59)
1	1.34 (0.590, 2.07)	<LOQ (<LOQ, <LOQ)	2.05 (1.37, 2.93)	0.0158 (0.0104, 0.0194)	0.0352 (0.0234, 0.0562)	3.45 (2.00, 5.08)
2	0.859 (0.695, 1.17)	<LOQ (<LOD, <LOQ)	1.01 (0.807, 1.27)	0.0107 (0.0102, 0.0113)	0.0174 (0.0159, 0.0195)	1.91 (1.71, 2.01)
7	0.139 (0.104, 0.188)	<LOD (<LOD, <LOD)	0.208 (0.187, 0.232)	<LOD (<LOD, <LOD)	<LOQ (<LOQ, <LOQ)	0.354 (0.299, 0.400)
14	0.0213 (0.0148, 0.0305)	<LOD (<LOD, <LOD)	0.0438 (0.0384, 0.0477)	<LOD (<LOD, <LOD)	<LOD (<LOD, <LOD)	0.0696 (0.0577, 0.0803)

DALA	Sulfoxaflor (mg/kg)	X11579457 (mg/kg)	X11719474 (mg/kg)	X11519540 (mg/kg)	X11721061 (mg/kg)	Total Sulfoxaflor Residues (TSR) (mg/kg)
			Whole Plant			
0	2.90 (2.68, 3.04)	0.0124 (0.0105, 0.0152)	2.94 (2.69, 3.25)	0.0534 (0.0468, 0.0609)	0.0965 (0.0775, 0.121)	6.01 (5.51, 6.49)
1	2.09 (1.77, 2.46)	0.0135 (0.0103, 0.0166)	2.89 (2.67, 3.21)	0.0451 (0.0413, 0.0508)	0.148 (0.131, 0.159)	5.18 (4.73, 5.45)
2	1.86 (1.46, 2.15)	0.0103 (<LOQ, 0.0152)	3.10 (2.67, 3.92)	0.0402 (0.0340, 0.0511)	0.124 (0.108, 0.138)	5.13 (4.31, 6.09)
7	0.551 (0.405, 0.839)	<LOQ (<LOQ, <LOQ)	4.67 (4.30, 4.97)	0.0262 (0.0163, 0.0412)	0.104 (0.0622, 0.159)	5.36 (4.79, 6.01)
14	0.147 (0.135, 0.157)	<LOQ (<LOQ, <LOQ)	0.368 (0.321, 0.440)	0.0194 (0.0174, 0.0218)	0.0785 (0.0693, 0.0863)	0.617 (0.560, 0.701)

LOQ/LOD = 0.00100/0.000300 mg/kg for sulfoxaflor in nectar; LOQ/LOD = 0.0100/0.00300 mg/kg for all remaining analytes in all remaining matrices.

Table 7. Mean (min, max) concentrations of analytes in strawberry pollen, nectar, and whole plant in Yuba City, California (Trial 14050-4116-02).

DALA	Sulfoxaflor (mg/kg)	X11579457 (mg/kg)	X11719474 (mg/kg)	X11519540 (mg/kg)	X11721061 (mg/kg)	Total Sulfoxaflor Residues (TSR) (mg/kg)
			Pollen from Flowers			
0	65.3 (50.2, 81.9)	0.183 (<LOD, 0.309)	37.2 (2.97, 71.8)	1.04 (0.467, 1.44)	0.191 (0.0639, 0.318)	104 (53.7, 138)
1	17.3 (1.99, 42.3)	<LOQ (<LOD, 0.0120)	3.00 (0.0628, 6.13)	0.264 (0.0259, 0.614)	0.118 (0.0250, 0.231)	20.7 (2.11, 46.0)
2	3.71 (2.75, 5.40)	<LOD (<LOD, <LOD)	0.262 (0.0240, 0.0500)	0.0287 (0.0149, 0.0481)	0.0201 (0.0138, 0.0296)	4.02 (3.04, 5.98)
7	0.585 (0.251, 1.04)	<LOD (<LOD, <LOD)	0.0303 (0.0223, 0.0448)	<LOD (<LOD, <LOD)	0.0113 (<LOQ, 0.0160)	0.630 (0.281, 1.08)
14	0.0491 (0.0379, 0.0670)	<LOD (<LOD, <LOD)	0.0181 (0.0120, 0.0260)	<LOD (<LOD, <LOD)	<LOQ (<LOQ, <LOQ)	0.0752 (0.0623, 0.0913)

DALA	Sulfoxaflor (mg/kg)	X11579457 (mg/kg)	X11719474 (mg/kg)	X11519540 (mg/kg)	X11721061 (mg/kg)	Total Sulfoxaflor Residues (TSR) (mg/kg)
Nectar from Flowers						
0	15.2 (13.2, 16.8)	0.0103 (<LOQ, 0.0153)	3.19 (1.10, 5.36)	0.138 (0.103, 0.164)	0.0175 (0.0170, 0.0183)	18.5 (16.4, 22.4)
1	3.81 (1.30, 5.46)	<LOD (<LOD, <LOD)	0.400 (0.117, 0.759)	0.0150 (<LOQ, 0.0257)	0.0249 (0.0206, 0.0272)	4.25 (1.65, 6.27)
2	0.849 (0.287 1.23)	<LOD (<LOD, <LOD)	0.183 (0.0255, 0.405)	<LOQ (<LOQ, 0.0140)	0.0175 (0.0141, 0.0224)	1.06 (0.333, 1.67)
7	0.202 (0.150, 0.273)	<LOD (<LOD, <LOD)	0.0882 (0.0556, 0.148)	<LOQ (<LOQ, <LOQ)	0.0113 (<LOQ, 0.0156)	0.308 (0.217, 0.443)
14	0.0480 (0.0292, 0.0678)	<LOD (<LOD, <LOD)	0.0319 (0.0222, 0.0424)	<LOD (<LOD, <LOD)	<LOD (<LOD, <LOD)	0.0880 (0.0683, 0.0980)
Whole Plant						
0	3.32 (2.12, 3.97)	<LOQ (<LOQ, 0.0109)	1.93 (1.49, 2.31)	0.0422 (0.0353, 0.0469)	0.0215 (0.0207, 0.0223)	5.32 (4.50, 5.92)
1	2.80 (1.71, 3.64)	<LOQ (<LOQ, <LOQ)	1.25 (1.14, 1.33)	0.0371 (0.0284, 0.0420)	0.0483 (0.0306, 0.0637)	4.14 (2.91, 5.04)
2	2.31 (1.63, 2.69)	<LOQ (<LOQ, <LOQ)	1.11 (0.850, 1.53)	0.0316 (0.0262, 0.0374)	0.0442 (0.0339, 0.0495)	3.50 (2.64, 4.24)
7	0.961 (0.704, 1.14)	<LOQ (<LOQ, <LOQ)	0.446 (0.312, 0.603)	0.0233 (0.0218, 0.0259)	0.0465 (0.0401, 0.0518)	1.48 (1.38, 1.64)
14	0.416 (0.319, 0.482)	<LOQ (<LOQ, <LOQ)	0.366 (0.284, 0.440)	0.0150 (0.0143, 0.0158)	0.0322 (0.0272, 0.0362)	0.835 (0.788, 0.904)

LOQ/LOD = 0.00100/0.000300 mg/kg for sulfoxaflor in nectar; LOQ/LOD = 0.0100/0.00300 mg/kg for all remaining analytes in all remaining matrices.

Considering all pollen sources, trends in sulfoxaflor and total sulfoxaflor residue concentrations declined in strawberry pollen, nectar, and whole plant samples from the early- and early-mid bloom period (0-2 DALA) to the late-bloom period (14 DALA) at both trial locations **(Figures 1-3)**.
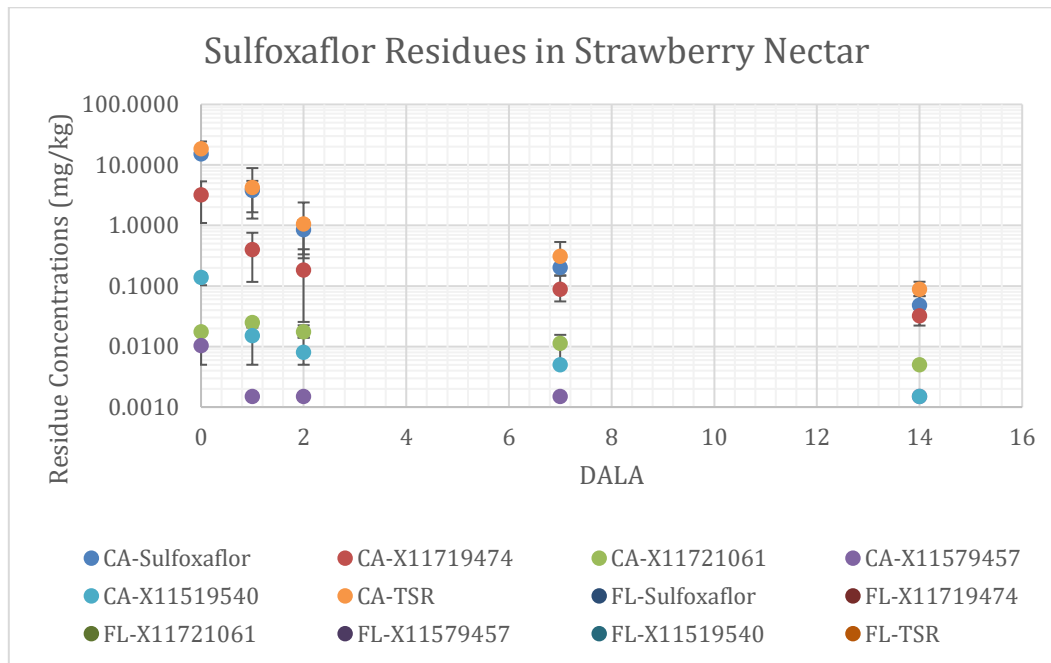

Figure 1. Mean measured sulfoxaflor, X11579457, X11719474, X11721061, X11519540 and total sulfoxaflor residues (TSR) in strawberry nectar across study sites. Error bars represent maximum and minimum replicate values.
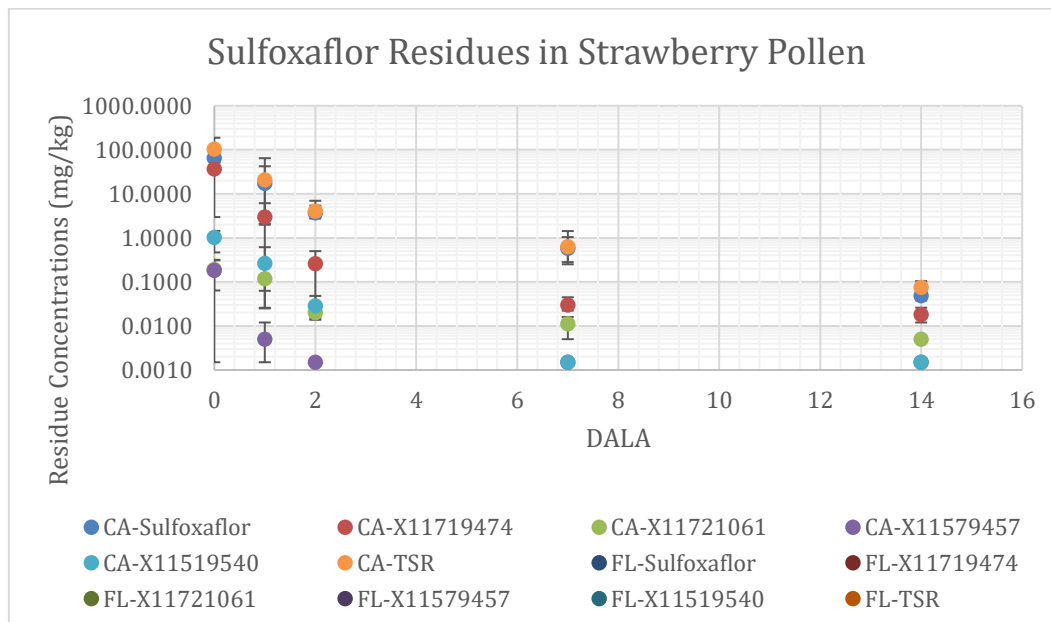

Figure 2. Mean measured sulfoxaflor, X11579457, X11719474, X11721061, X11519540 and total sulfoxaflor residues (TSR) in strawberry pollen across study sites. Error bars represent maximum and minimum replicate values.
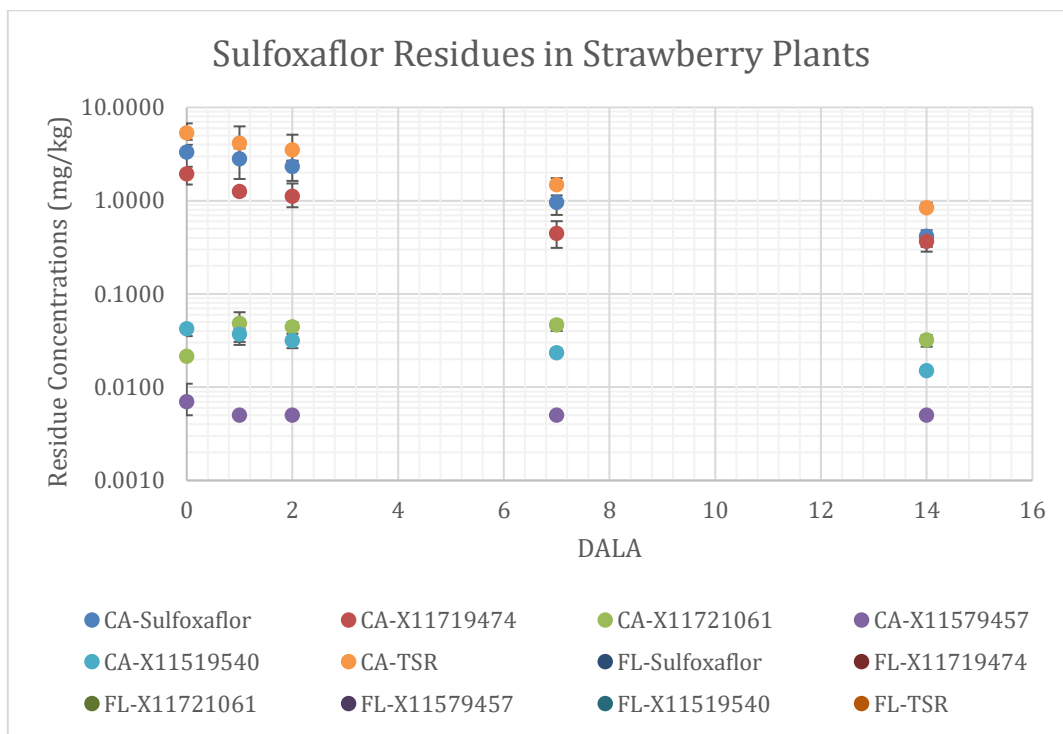
Figure 3. Mean measured sulfoxaflor, X11579457, X11719474, X11721061, X11519540 and total sulfoxaflor residues (TSR) in strawberry whole plant across study sites. Error bars represent maximum and minimum replicate values.

6.C. RESIDUE DECLINE (DT$_{50}$) IN STRAWBERRY MATRICES

For estimation of DT$_{50}$ and DT$_{90}$ values of sulfoxaflor in pollen and nectar, kinetic evaluation of sulfoxaflor residues data was conducted using the Computer Assisted Kinetic Evaluation (CAKE) software, version 3.3. Due to the relatively small number of sampling events over time, DT$_{50}$ and DT$_{90}$ values were estimated using the single first order model (SFO) to avoid overparameterization of the data sets with higher order models. Estimation of DT$_{50}$ and DT$_{90}$ values was done on an individual trial basis whenever possible and when replicate samples were measured within a sampling event. Prior to estimating DT$_{50}$ and DT$_{90}$ values, residue trial data sets were screened to ensure that sufficient data were available to produce reliable estimates (e.g., replicate values above the LOQ for 4 or more sampling events with appropriate spacing between sampling events).

The reliability of DT$_{50}$ estimates was evaluated based on several statistical attributes of the SFO model fit:
- statistical significance of the dissipation rate constant (k);
- correlation coefficient (r2);
- 90th percentile confidence limits around 'k'.

Due to the large degree of variability associated with pollen and nectar residue data with other pesticides, the following criteria were used to determine acceptability of DT$_{50}$ estimates from this analysis:

- p values for 'k' of 0.1 or less;

- r2 of 0.25 or greater; and
- 90th percentile C.L. of 'k' which did not overlap zero.

With the strawberry residue data set, reliable DT_{50} estimates could be estimated for both trails (FL and CA) and both the nectar and pollen matrices. Three replicate measurements were taken on each of the 5 sampling events at appropriate intervals given the relatively fast dissipation kinetics of sulfoxaflor.

Results are provided in **Table 8 and Appendix 1**.

Table 8. DT_{50} and DT_{90} values for sulfoxaflor in alfalfa matrices by study region. *

Region	DT_{50} Values (days)	DT_{90} Values (days)
Nectar from Flowers		
Florida	2.6	8.6
California	0.50	1.7
Pollen from Flowers		
Florida	0.88	2.9
California	0.51	1.7

*DT_{50} values were calculated following the maximum mean detection.

7. STUDY STRENGTHS, LIMITATIONS AND CONCLUSIONS

In the context of documenting the magnitude of sulfoxaflor residues in bee-related matrices of strawberry resulting from two foliar applications (the maximum seasonal treatment level), the following strengths are observed with this study.
1. Analytical methods were sufficiently accurate and precise based on QA data.
2. Concentrations were measured for toxicologically-relevant metabolites in three bee-relevant plant matrices.
3. Application methods and rates were well documented.
4. Sampling contained an adequate amount of replication and compositing to follow EPA recommendations for studies conducted on the magnitude of residues in pollen.
5. Trials were conducted across two different states in two different Ecoregions (NAFTA 3 and 10). This allowed for comparison of residue magnitudes in strawberry matrices across different soil type and climatic conditions. In addition, trials were conducted during two different growing periods (January or July).
6. Pre-treatment samples of whole plant did not contain quantifiable levels of sulfoxaflor or any of its metabolites.

The following limitations were noted with this study:
1. % recovery of sulfoxaflor in pollen QC spikes exceeds acceptance criteria for 3/6 samples at LOQ (e.g., **124% - 154%);** justification for excluding samples from mean % recovery was not provided or is questionable. While this is a deviation, over estimation of sample residue would be protective of a lower value and these deviations affect values near the LOQ.
2. Only two sites were evaluated, whereas USEPA (2016) recommends a minimum of 3 sites/regions within the growing area. Therefore, variability in residue values associated with geographic differences among growing regions may be underestimated.

Overall, considering the strengths and limitations of this study, the following conclusions can be drawn:

1. Two foliar applications to strawberry plants at 0.070 lb ai/A/application (based on a maximum seasonal rate of 0.140 lb ai/A), yielded detectable residues of sulfoxaflor in nectar, pollen and whole plants at both trial sites.

2. In strawberry plant matrices, total sulfoxaflor residues (TSR) were greatest for each trial site in pollen, followed by nectar and then whole plant matrices, and measured residues were greater in the California trial (Trial 2) compared to Florida (Trial 1). In California, maximum mean TSR levels were 104, 18.5, and 5.32 mg/kg in pollen, nectar, and whole plant matrices, respectively, and in Florida, maximum mean TSR levels were 23.8, 3.45, and 6.01 mg/kg, respectively.

3. In pollen samples, parent sulfoxaflor accounted for the majority of TSR at both trial sites, while in nectar and whole plant samples, sulfoxaflor accounted for the majority of TSR at the California trial, and metabolite X11719474 accounted for the majority of TSR at the Florida trial. Maximum mean concentrations of sulfoxaflor observed at the California trial (0 DALA) were 65.3 mg/kg in pollen, 15.2 mg/kg in nectar, and 3.32 mg/kg in whole plant. Maximum mean concentrations of sulfoxaflor at the Florida trial (0 DALA) were 18.8, 1.41, and 2.90 mg/kg in pollen, nectar, and whole plant samples, respectively. The major metabolite, X11719474, was present at maximum mean concentrations of 4.72 and 37.2 mg/kg in pollen from Florida and California trials (each at 0 DALA), respectively, and ranged from maximum means of 1.93 to 4.67 mg/kg in nectar and whole plant samples from both trials (0 to 7 DALA). Metabolite X11519540 was present at maximum mean concentrations of 0.190 and 1.04 mg/kg in pollen from Florida and California trials (each at 0 DALA), respectively. Metabolites X11579457 and X11721061 were found at maximum mean concentrations of 0.183 mg/kg and 0.191 mg/kg, respectively, in pollen from the California trial (each at 0 DALA).

4. Trends in sulfoxaflor and total sulfoxaflor residue (TSR) concentrations declined in strawberry pollen, nectar, and whole plant samples from the early- and early-mid bloom period (0-2 DALA) to the late-bloom period (14 DALA) at both trial locations.

5. The DT_{50} values for sulfoxaflor in nectar were 0.50 (CA site) and 2.6 days (FL site). The DT_{50} values for sulfoxaflor in pollen were 0.51 (CA site) and 0.88 days (FL site).

## 8. STUDY VALIDITY/CLASSIFICATION

Data from the two study locations are considered scientifically sound and useful for risk assessment purposes, although these trials were conducted within a single growing season. Overall, this study is classified as **supplemental** for quantitative use in risk assessment.

9. REFERENCES

Rodrigues Jr., A. 2011. Frozen Storage Stability of Sulfoxaflor (XDE-208) and its Main Metabolites in Crops. MRID 47832224. Unpublished study. Dow AgroSciences Study ID: 090091. June 14, 2011.

Howerton, H., and L. Gilson. 2017. Residues of Sulfoxaflor in Sunflower Nectar and Pollen after Foliar Application with GF-2372. Unpublished study. Dow AgroSciences Study ID: 150537. June 9, 2017.

USEPA 2016. Guidance on Exposure and Effects Testing for Assessing Risks to Bees. Office of Pesticide Programs, U.S. Environmental Protection Agency, July 5, 2016

APPENDIX I. OUTPUT FROM DT50 ANALYSIS

1. Strawberry, Nectar (0.074 ai/A Adj to 0.071 lb/A) FL Trial, MRID 50444402

CAKE Kinetic Evaluation Report

Data set: Strawb_N_0.071_FL (SFO)

Graphical Summary:
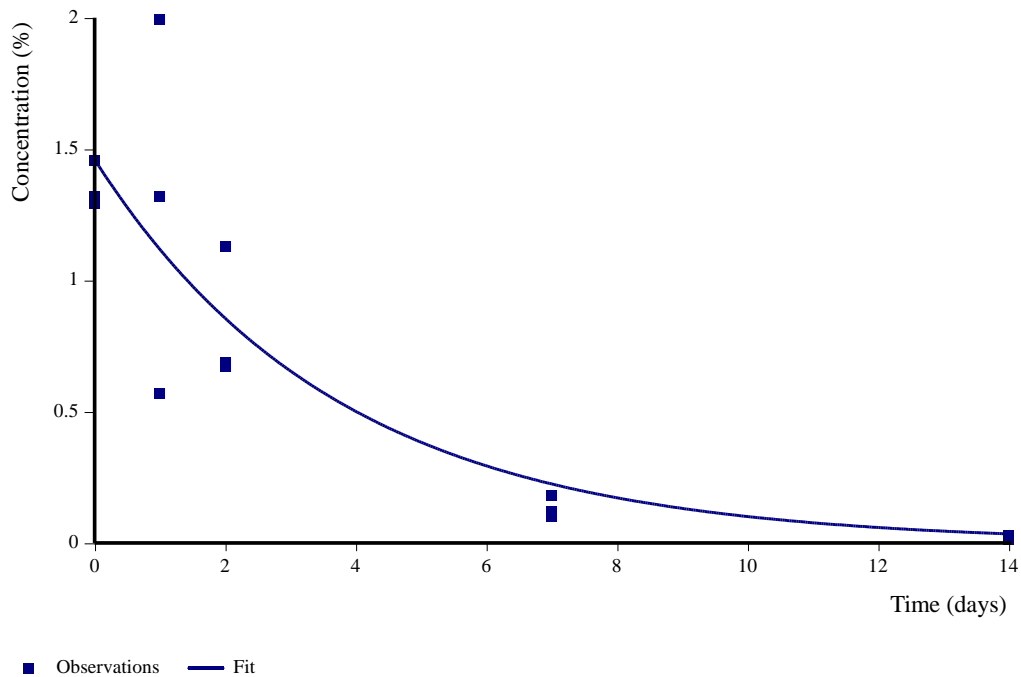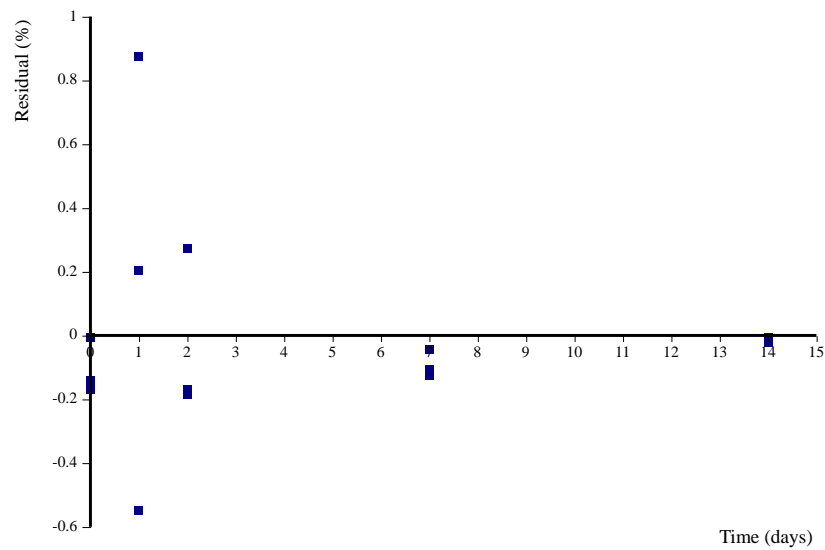
Observations and Fitted Model:

Residuals:

Initial Values for this Step:

Parameter	Initial Value	Bounds	Fixed
Parent_0	100	0 to (unbounded)	No
k_Parent	0.1	0 to (unbounded)	No

Estimated Values:

Parameter	Value	σ	Prob. > t	Lower (90%) CI	Upper (90%) CI	Lower (95%) CI	Upper (95%) CI
Parent_0	1.46	0.1613	N/A	1.174	1.746	1.112	1.809
k_Parent	0.2674	0.08593	0.004128	0.1152	0.4196	0.08176	0.453

χ^2

Parameter	Error %	Degrees of Freedom
All data	11.2	3
Parent	11.2	3

Decay Times:

Compartment	DT50 (days)	DT90 (days)
Parent	2.59	8.61

Additional Statistics:

Parameter	r² (Obs v Pred)	Efficiency
All data	0.7767	0.7756
Parent	0.7767	0.7756

Parameter Correlation:

	Parent_0	k_Parent
Parent_0	1	0.5757

k_Parent	0.5757	1

Observed v. Predicted:

Compartment Parent

Time (days)	Value (%)	Predicted Value	Residual
0	1.455	1.46	-0.005054
0	1.291	1.46	-0.1691
0	1.32	1.46	-0.1401
1	0.568	1.117	-0.5495
1	1.994	1.117	0.8765
1	1.32	1.117	0.2025
2	0.687	0.8553	-0.1683
2	1.127	0.8553	0.2717
2	0.67	0.8553	-0.1853
7	0.1	0.2247	-0.1247
7	0.181	0.2247	-0.04366
7	0.119	0.2247	-0.1057
14	0.029	0.03457	-0.005565
14	0.018	0.03457	-0.01657
14	0.014	0.03457	-0.02057

Sequence Creation Information:
Fit generated by CAKE version 3.3 (Release)
running on R version 3.0.0 (2013-04-03)

Report Information:
Report generated by CAKE version 3.3 (Release)
CAKE developed by Tessella Ltd, Abingdon, Oxfordshire, UK, sponsored by Syngenta
Running on .NET version 4.0.30319.42000
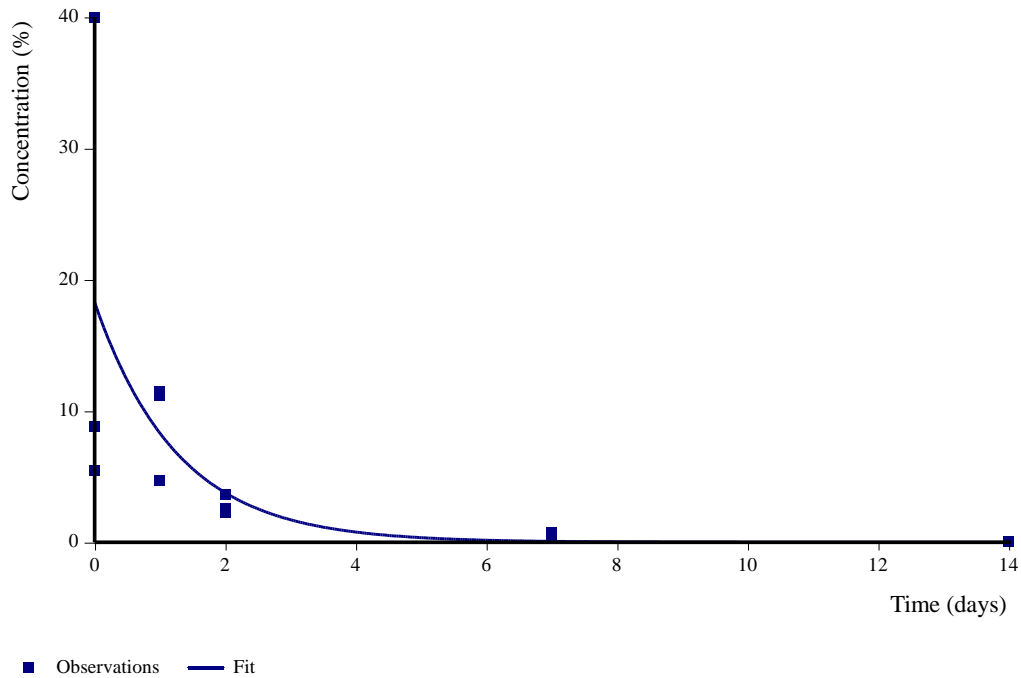
2. Strawberry, Pollen (0.074 ai/A Adj to 0.071 lb/A) FL Trial, MRID 50444402
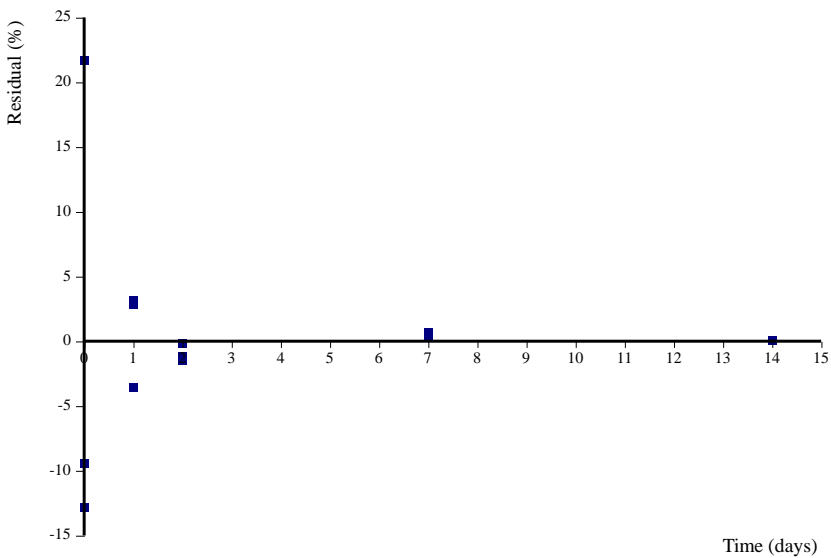
CAKE Kinetic Evaluation Report

Data set: Strawb_P_0.071_FL (SFO)

Graphical Summary:

Observations and Fitted Model:

Residuals:

Initial Values for this Step:

Parameter	Initial Value	Bounds	Fixed
Parent_0	100	0 to (unbounded)	No
k_Parent	0.1	0 to (unbounded)	No

Estimated Values:

Parameter	Value	σ	Prob. > t	Lower (90%) CI	Upper (90%) CI	Lower (95%) CI	Upper (95%) CI
Parent_0	18.27	4.362	N/A	10.55	26	8.85	27.7
k_Parent	0.7887	0.4341	0.04615	0.02006	1.557	-0.149	1.726

χ^2

Parameter	Error %	Degrees of Freedom
All data	8.01	3
Parent	8.01	3

Decay Times:

Compartment	DT50 (days)	DT90 (days)
Parent	0.879	2.92

Additional Statistics:

Parameter	r² (Obs v Pred)	Efficiency
All data	0.4743	0.4743
Parent	0.4743	0.4743

Parameter Correlation:

	Parent_0	k_Parent
Parent_0	1	0.4249
k_Parent	0.4249	1

Observed v. Predicted:

Compartment Parent

Time (days)	Value (%)	Predicted Value	Residual
0	39.98	18.27	21.71
0	5.472	18.27	-12.8
0	8.824	18.27	-9.45
1	4.749	8.304	-3.555
1	11.18	8.304	2.871
1	11.46	8.304	3.16
2	3.613	3.774	-0.1605
2	2.264	3.774	-1.51
2	2.611	3.774	-1.163
7	0.756	0.07312	0.6829
7	0.59	0.07312	0.5169

| 7	0.464	0.07312	0.3909
14	0.058	0.000293	0.05771
14	0.082	0.000293	0.08171
14	0.042	0.000293	0.04171

Sequence Creation Information:
Fit generated by CAKE version 3.3 (Release)
running on R version 3.0.0 (2013-04-03)

Report Information:
Report generated by CAKE version 3.3 (Release)
CAKE developed by Tessella Ltd, Abingdon, Oxfordshire, UK, sponsored by Syngenta
Running on .NET version 4.0.30319.42000

3. Strawberry, Nectar (0.072 ai/A Adj to 0.071 lb/A) CA Trial, MRID 50444402

CAKE Kinetic Evaluation Report

0.071_CA (SFO)

Graphical Summary:
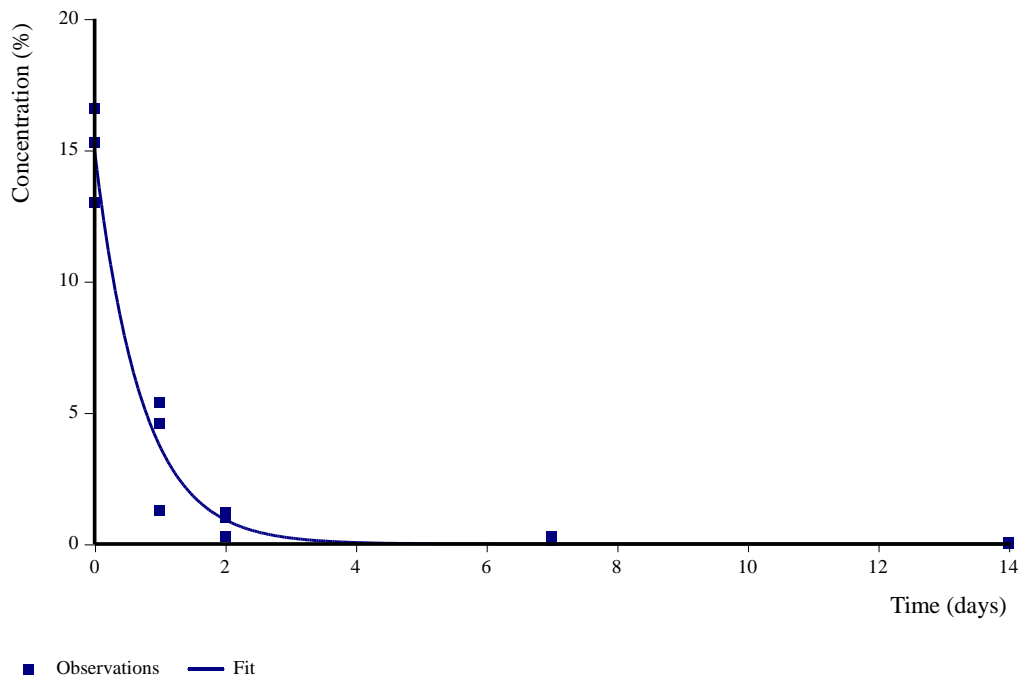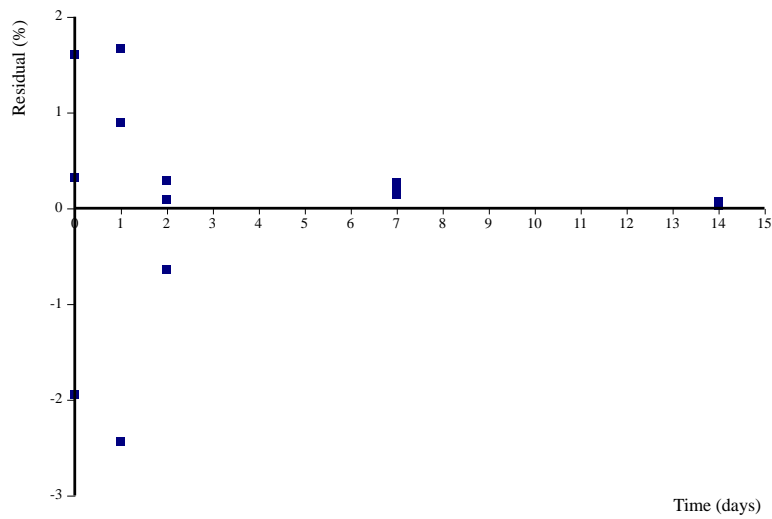
Observations and Fitted Model:

Residuals:

Initial Values for this Step:

Parameter	Initial Value	Bounds	Fixed
Parent_0	100	0 to (unbounded)	No
k_Parent	0.1	0 to (unbounded)	No

Estimated Values:

Parameter	Value	σ	Prob. > t	Lower (90%) CI	Upper (90%) CI	Lower (95%) CI	Upper (95%) CI
Parent_0	14.96	0.6513	N/A	13.81	16.11	13.55	16.37
k_Parent	1.393	0.1621	5.06E-007	1.106	1.68	1.043	1.743

χ^2

Parameter	Error %	Degrees of Freedom
All data	2.03	3
Parent	2.03	3

Decay Times:

Compartment	DT50 (days)	DT90 (days)
Parent	0.498	1.65

Additional Statistics:

Parameter	r² (Obs v Pred)	Efficiency
All data	0.9667	0.9666
Parent	0.9667	0.9666

Parameter Correlation:

	Parent_0	k_Parent
Parent_0	1	0.242
k_Parent	0.242	1

Observed v. Predicted:

Compartment Parent

Time (days)	Value (%)	Predicted Value	Residual
0	15.29	14.96	0.3235
0	16.57	14.96	1.605
0	13.02	14.96	-1.945
1	4.605	3.715	0.89
1	5.384	3.715	1.669
1	1.282	3.715	-2.433
2	1.016	0.9225	0.09353
2	1.213	0.9225	0.2905
2	0.283	0.9225	-0.6395
7	0.269	0.0008699	0.2681
7	0.181	0.0008699	0.1801
7	0.148	0.0008699	0.1471
14	0.067	0	0.067
14	0.046	0	0.046
14	0.029	0	0.029

Sequence Creation Information:
Fit generated by CAKE version 3.3 (Release)
running on R version 3.0.0 (2013-04-03)

Report Information:
Report generated by CAKE version 3.3 (Release)
CAKE developed by Tessella Ltd, Abingdon, Oxfordshire, UK, sponsored by Syngenta
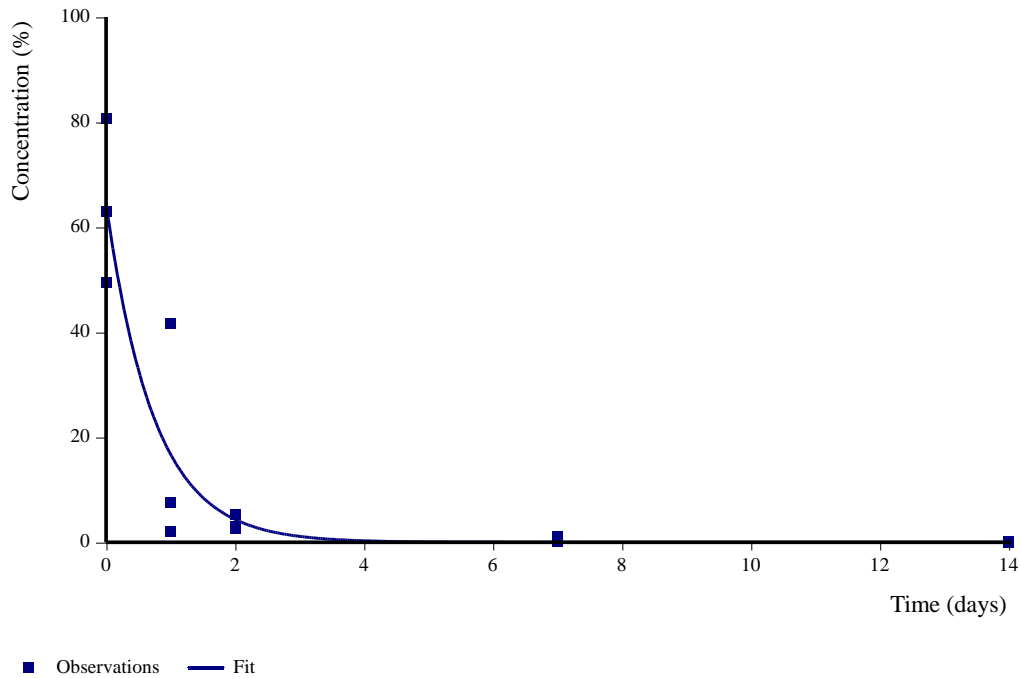Running on .NET version 4.0.30319.42000

4. Strawberry, Pollen (0.072 ai/A Adj to 0.071 lb/A) CA Trial, MRID 50444402
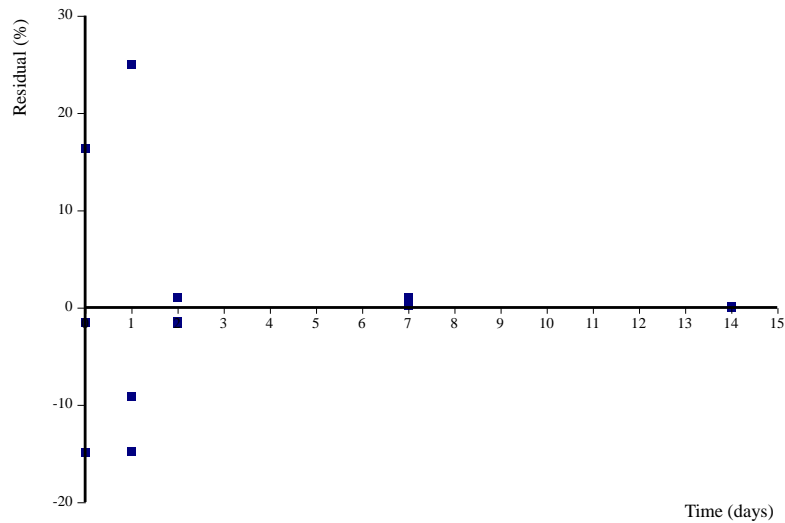
CAKE Kinetic Evaluation Report

Data set: Strawb_P_0.071_CA (SFO)

Graphical Summary:

Observations and Fitted Model:

Residuals:

Initial Values for this Step:

Parameter	Initial Value	Bounds	Fixed
Parent_0	100	0 to (unbounded)	No
k_Parent	0.1	0 to (unbounded)	No

Estimated Values:

Parameter	Value	σ	Prob. > t	Lower (90%) CI	Upper (90%) CI	Lower (95%) CI	Upper (95%) CI
Parent_0	64.44	6.032	N/A	53.76	75.12	51.41	77.47
k_Parent	1.348	0.3311	6.61E-004	0.7616	1.934	0.6327	2.063

χ^2

Parameter	Error %	Degrees of Freedom
All data	2.02	3
Parent	2.02	3

Decay Times:

Compartment	DT50 (days)	DT90 (days)
Parent	0.514	1.71

Additional Statistics:

Parameter	r² (Obs v Pred)	Efficiency
All data	0.8626	0.8626
Parent	0.8626	0.8626

Parameter Correlation:

	Parent_0	k_Parent
Parent_0	1	0.2527
k_Parent	0.2527	1

Observed v. Predicted:

Compartment Parent

Time (days)	Value (%)	Predicted Value	Residual
0	49.5	64.44	-14.94
0	62.91	64.44	-1.526
0	80.76	64.44	16.32
1	1.962	16.74	-14.78
1	7.613	16.74	-9.126
1	41.71	16.74	24.97
2	2.939	4.348	-1.409
2	2.712	4.348	-1.636
2	5.325	4.348	0.9768
7	0.458	0.005143	0.4529
7	1.026	0.005143	1.021

7	0.248	0.005143	0.2429
14	0.066	0	0.066
14	0.037	0	0.037
14	0.042	0	0.042

Sequence Creation Information:
Fit generated by CAKE version 3.3 (Release)
running on R version 3.0.0 (2013-04-03)

Report Information:
Report generated by CAKE version 3.3 (Release)
CAKE developed by Tessella Ltd, Abingdon, Oxfordshire, UK, sponsored by Syngenta
Running on .NET version 4.0.30319.42000